

Give the **inverse** of each relation. Tell whether the inverse is a function and how you know.

14.)  $\{(5, 2) (4, 3) (3, 4) (2, 5)\}$

4  $\{(2, 5) (3, 4) (4, 3) (5, 2)\}$   
yes - every input has 1 output

15.)  $\{(1, 2) (2, 3) (3, 2) (4, 1)\}$

$\{(2, 1) (3, 2) (2, 3) (1, 4)\}$   
no - 2 has two different outputs

For each function, find an **equation** for the **inverse**.

16.)  $h(x) = \frac{x+8}{3}$

$h^{-1}(x)$

$g(x) = 3x - 8$

2  $y = \frac{x+8}{3}$   
 $3y = x+8$   
 $3y-8 = x$

17.)  $g(x) = -2x - 7$

$y = -2x - 7$

$\frac{y+7}{-2} = \frac{-2x}{-2}$

$\frac{y+7}{-2} = x$

$g^{-1}(x) = \frac{x+7}{-2}$

18.) In a number puzzle, you are told to add 4 to your age, then multiply by 2, subtract 6 and finally divide by 2. You give the result, and the person tells you your age. Use an inverse function to explain how this works.

2  $\frac{2(x+4)}{2} = y$

The answer is just you age plus 4,  
so the person can subtract  
4 and tell you your age.

Use the functions  $f(x) = 3x - 2$  and  $g(x) = 5x + 2$  for the following problems.

19.) Find  $(f+g)(3)$

9-2 15+2 20.) Find  $(f \circ g)(-1)$

$(3x-2) + (5x+2)$   
 $8x$

$7 + 17$   
 $7+17 = \boxed{24}$

2  $f+g(3) = 8(3)$   
 $= \boxed{24}$

$f \circ g(x) = 3(5x-2) - 2 = 15x - 6 - 2 = 15x - 8$

$f \circ g(-1) = 3(5(-1)-2) - 2$

$3(-5-2) - 2$

$3(-7) - 2$

$-21 - 2$

$\boxed{-23}$

16.) Simplify each expression.

a.)  $3 + 5 - (3 - 2)$

b.)  $6 \cdot 2 \div 4 \cdot 3$

c.)  $3^2 + 3(5)$

$3+5-1$

$12 \div 4 \cdot 3$

$3^2 + 15$

$8-1$

$3 \cdot 3$

$9+15$

$\boxed{7}$

$\boxed{9}$

$\boxed{24}$